

**WE CLAIM:**

1. A nonwoven material comprising:
  - a) a web of substantially continuous A/B bicomponent crimped fibers,
  - b) the web having a percentage difference between a formation index of a top side of the web and a formation index of a wire side of the web of less than about 11%.
2. The nonwoven material according to Claim 1 wherein:
  - a) the web has a formation index averaging above about 37.6 on the top side of the web when the web has a bulk to about 0.1 inches in the Z axis, or wherein
  - b) the web has a formation index averaging above about 32.03 on the top side of the web when the web has a bulk of over about 0.1 inches in the Z axis.
3. The nonwoven material according to Claim 1 wherein:
  - a) the web has a formation index averaging above about 43.76 on the wire side of the web when the web has a bulk to about 0.1 inches in the Z axis, or wherein
  - b) the web has a formation index averaging above about 37.09 on the wire side of the web when the web has a bulk of over about 0.1 inches in the Z axis.
4. The nonwoven material according to Claim 1 wherein:
  - a) the web has a formation index averaging above about 37.6 on the top side of the web when the web has a basis weight of up to 1.5 osy, or wherein
  - b) the web has a formation index averaging above about 32.03 on the top side of the web when the web has a basis weight of over about 1.5 osy.
5. The nonwoven material according to Claim 1 wherein:
  - a) the web has a formation index averaging above about 43.76 on the wire side of the web when the web has a basis weight of up to 1.5 osy, or wherein
  - b) the web has a formation index averaging above about 37.09 on the wire

side of the web when the web has a basis weight of over about 1.5 osy.

6. The nonwoven material according to Claim 1 wherein:

i) the web has a formation index averaging above about 19.07 on the top side of the web when the web has a bulk of about 0.35 inches in the Z axis, or wherein

ii) the web has a formation index averaging above about 32.03 on the top side of the web when the web has a bulk of about 0.12 inches in the Z axis, or wherein

iii) the web has a formation index averaging above about 28.73 on the top side of the web when the web has a bulk of about 0.1 inches in the Z axis, or wherein

iv) the web has a formation index averaging above about 34.63 on the top side of the web when the web has a bulk of about 0.08 inches in the Z axis, or wherein

v) the web has a formation index averaging above about 37.6 on the top side of the web when the web has a bulk of about 0.07 inches in the Z axis.

7. The nonwoven material according to Claim 1 wherein:

i) the web has a formation index averaging above about 31.6 on the wire side of the web when the web has a bulk of about 0.35 inches in the Z axis, or wherein

ii) the web has a formation index averaging above about 37.09 on the wire side of the web when the web has a bulk of about 0.12 inches in the Z axis, or wherein

iii) the web has a formation index averaging above about 35.37 on the wire side of the web when the web has a bulk of about 0.1 inches in the Z axis, or wherein

iv) the web has a formation index averaging above about 38.98 on the wire side of the web when the web has a bulk of about 0.08 inches in the Z axis, or wherein

v) the web has a formation index averaging above about 43.76 on the wire side of the web when the web has a bulk of about 0.07 inches in the Z axis.

8. The nonwoven material according to Claim 1 wherein:

i) the web has a formation index averaging above about 19.07 on the top side of the web when the web has a basis weight of about 6.0 osy, or wherein

ii) the web has a formation index averaging above about 32.03 on the top side of the web when the web has a basis weight of about 2.5 osy, or wherein

iii) the web has a formation index averaging above about 30.27 on the top side of the web when the web has a basis weight of about 2.25 osy, or wherein

iv) the web has a formation index averaging above about 28.73 on the top side of the web when the web has a basis weight of about 1.5 osy, or wherein

v) the web has a formation index averaging above about 31.07 on the top side of the web when the web has a basis weight of about 1.2 osy, or wherein

vi) the web has a formation index averaging above about 34.63 on the top side of the web when the web has a basis weight of about 1.0 osy, or wherein

vii) the web has a formation index averaging above about 37.6 on the top side of the web when the web has a basis weight of about 0.75 osy.

9. The nonwoven material according to Claim 1 wherein:

i) the web has a formation index averaging above about 31.6 on the wire side of the web when the web has a basis weight of about 6.0 osy, or wherein

ii) the web has a formation index averaging above about 37.09 on the wire side of the web when the web has a basis weight of about 2.5 osy, or wherein

iii) the web has a formation index averaging above about 35.03 on the wire side of the web when the web has a basis weight of about 2.25 osy, or wherein

iv) the web has a formation index averaging above about 35.37 on the wire side of the web when the web has a basis weight of about 1.5 osy, or wherein

v) the web has a formation index averaging above about 37.15 on the wire side of the web when the web has a basis weight of about 1.2 osy, or wherein

vi) the web has a formation index averaging above about 38.98 on the wire side of the web when the web has a basis weight of about 1.0 osy, or wherein

vii) the web has a formation index averaging above about 43.76 on the wire side of the web when the web has a basis weight of about 0.75 osy.

10. The nonwoven material of Claim 1 wherein the fibers have a fiber denier of between about 0.1 dpf to about 9.0 dpf.

11. The nonwoven material of Claim 10 wherein the fibers have a fiber

denier of between about 0.1 dpf to about 6.0 dpf.

12. The nonwoven material of Claim 10 wherein the fibers have a fiber denier of between about 0.1 dpf to about 5.0 dpf.

13. The nonwoven material of Claim 11 wherein the fibers have a fiber denier of between about 0.1 dpf to about 4.2 dpf.

14. The nonwoven material of Claim 12 wherein the fibers have a fiber denier of between about 0.1 dpf to about 3.3 dpf.

15. The nonwoven material of Claim 10 wherein the fibers have a fiber denier of between about 3.4 dpf to about 4.2 dpf.

16. The nonwoven material of Claim 15 wherein the fibers have a substantially white color.

17. The nonwoven material of Claim 16 wherein the fibers have a  $\text{TiO}_2$  percentage of about 0.1% to about 5%.

18. The nonwoven material of Claim 17 wherein the fibers have a  $\text{TiO}_2$  percentage of about 2%.

19. The nonwoven material according to Claim 1 wherein the fibers of the nonwoven web are integrally bonded.

20. The nonwoven web according to Claim 2 wherein:

a) the web has a formation index averaging above about 43.76 on the wire side of the web when the web has a bulk to about 0.1 inches in the Z axis, or wherein

b) the web has a formation index averaging above about 37.09 on the wire side of the web when the web has a bulk of over about 0.1 inches in the Z axis.

21. The nonwoven web according to Claim 20 wherein:

- a) the web has a formation index averaging above about 37.6 on the top side of the web when the web has a basis weight of up to 1.5 osy, or wherein
- b) the web has a formation index averaging above about 32.03 on the top side of the web when the web has a basis weight of over about 1.5 osy.

22. The nonwoven web according to Claim 21 wherein:

- a) the web having a formation index averaging above about 43.76 on the wire side of the web when the web has a basis weight of up to 1.5 osy, or wherein
- b) the web has a formation index averaging above about 37.09 on the wire side of the web when the web has a basis weight of over about 1.5 osy.

23. The nonwoven web according to Claim 22 wherein:

- i) the web has a formation index averaging above about 19.07 on the top side of the web when the web has a bulk of about 0.35 inches in the Z axis, or wherein
- ii) the web has a formation index averaging above about 32.03 on the top side of the web when the web has a bulk of about 0.12 inches in the Z axis, or wherein
- iii) the web has a formation index averaging above about 28.73 on the top side of the web when the web has a bulk of about 0.1 inches in the Z axis, or wherein
- iv) the web has a formation index averaging above about 34.63 on the top side of the web when the web has a bulk of about 0.08 inches in the Z axis, or wherein
- v) the web has a formation index averaging above about 37.6 on the top side of the web when the web has a bulk of about 0.07 inches in the Z axis.

24. The nonwoven web according to Claim 23 wherein:

- i) the web has a formation index averaging above about 31.6 on the wire side of the web when the web has a bulk of about 0.35 inches in the Z axis, or wherein
- ii) the web has a formation index averaging above about 37.09 on the wire side of the web when the web has a bulk of about 0.12 inches in the Z axis, or wherein
- iii) the web has a formation index averaging above about 35.37 on the wire side of

the web when the web has a bulk of about 0.1 inches in the Z axis, or wherein

iv) the web has a formation index averaging above about 38.98 on the wire side of the web when the web has a bulk of about 0.08 inches in the Z axis, or wherein

v) the web has a formation index averaging above about 43.76 on the wire side of the web when the web has a bulk of about 0.07 inches in the Z axis.

25. The nonwoven web according to Claim 24 wherein:

i) the web which has a formation index averaging above about 19.07 on the top side of the web when the web has a basis weight of about 6.0 osy, or wherein

ii) the web which has a formation index averaging above about 32.03 on the top side of the web when the web has a basis weight of about 2.5 osy, or wherein

iii) the web which has a formation index averaging above about 30.27 on the top side of the web when the web has a basis weight of about 2.25 osy, or wherein

iv) the web which has a formation index averaging above about 28.73 on the top side of the web when the web has a basis weight of about 1.5 osy, or wherein

v) the web which has a formation index averaging above about 31.07 on the top side of the web when the web has a basis weight of about 1.2 osy, or wherein

vi) the web which has a formation index averaging above about 34.63 on the top side of the web when the web has a basis weight of about 1.0 osy, or wherein

vii) the web which has a formation index averaging above about 37.6 on the top side of the web when the web has a basis weight of about 0.75 osy.

26. The nonwoven web according to Claim 25 wherein:

i) the web which has a formation index averaging above about 31.6 on the wire side of the web when the web has a basis weight of about 6.0 osy, or wherein

ii) the web which has a formation index averaging above about 35.03 on the wire side of the web when the web has a basis weight of about 2.25 osy, or wherein

iii) the web which has a formation index averaging above about 37.09 on the wire side of the web when the web has a basis weight of about 2.5 osy, or wherein

iv) the web which has a formation index averaging above about 35.37 on the wire side of the web when the web has a basis weight of about 1.5 osy, or wherein

v) the web which has a formation index averaging above about 37.15 on the wire side of the web when the web has a basis weight of about 1.2 osy, or wherein

vi) the web which has a formation index averaging above about 38.98 on the wire side of the web when the web has a basis weight of about 1.0 osy, or wherein

vii) the web which has a formation index averaging above about 43.76 on the wire side of the web when the web has a basis weight of about 0.75 osy.

27. The web of Claim 26 wherein the fibers have a fiber denier of between about 0.1 dpf to about 6.0 dpf.

28. The web of Claim 27 wherein the fibers have a fiber denier of between about 0.1 dpf to about 4.2 dpf.

29. The web of Claim 28 wherein the fibers have a fiber denier of between about 0.1 dpf to about 3.3 dpf.

30. The web of Claim 27 wherein the fibers have a fiber denier of between about 3.4 dpf to about 4.2 dpf.

31. The web of Claim 26 wherein the fibers have a substantially white color.

32. The web of Claim 31 wherein the fibers have a  $\text{TiO}_2$  percentage of about 0.1% to about 5%.

33. The web of Claim 32 wherein the fibers have a  $\text{TiO}_2$  percentage of about 2%.

34. The nonwoven web according to Claim 26 wherein the fibers of the nonwoven web are integrally bonded.

35. A nonwoven web comprising:

- a) substantially continuous A/B bicomponent crimped fibers;
- b) the web having a formation index averaging above about 37.6 on the top side of the web when the web has a bulk to about 0.1 inches in the Z axis, or
- c) the web having a formation index averaging above about 32.03 on the top side of the web when the web has a bulk of over about 0.1 inches in the Z axis.

36. The nonwoven web according to Claim 35 wherein:

- a) the web has a formation index averaging above about 43.76 on the wire side of the web when the web has a bulk to about 0.1 inches in the Z axis, or wherein
- b) the web has a formation index averaging above about 37.09 on the wire side of the web when the web has a bulk of over about 0.1 inches in the Z axis.

37. The nonwoven web according to Claim 35 wherein:

- a) the web has a formation index averaging above about 37.6 on the top side of the web when the web has a basis weight of up to 1.5 osy, or wherein
- b) the web has a formation index averaging above about 32.03 on the top side of the web when the web has a basis weight of over about 1.5 osy.

38. The nonwoven web according to Claim 35 wherein:

- a) the web has a formation index averaging above about 43.76 on the wire side of the web when the web has a basis weight of up to 1.5 osy, or wherein
- b) the web has a formation index averaging above about 37.09 on the wire side of the web when the web has a basis weight of over about 1.5 osy.

39. The nonwoven web according to Claim 35 wherein:

- i) the web has a formation index averaging above about 19.07 on the top side of the web when the web has a bulk of about 0.35 inches in the Z axis, or wherein
- ii) the web has a formation index averaging above about 32.03 on the top side of the web when the web has a bulk of about 0.12 inches in the Z axis, or wherein
- iii) the web has a formation index averaging above about 28.73 on the top side of



the web when the web has a bulk of about 0.1 inches in the Z axis, or wherein

iv) the web has a formation index averaging above about 34.63 on the top side of the web when the web has a bulk of about 0.08 inches in the Z axis, or wherein

v) the web has a formation index averaging above about 37.6 on the top side of the web when the web has a bulk of about 0.07 inches in the Z axis.

40. The nonwoven web according to Claim 35 wherein:

i) the web has a formation index averaging above about 31.6 on the wire side of the web when the web has a bulk of about 0.35 inches in the Z axis, or wherein

ii) the web has a formation index averaging above about 37.09 on the wire side of the web when the web has a bulk of about 0.12 inches in the Z axis, or wherein

iii) the web has a formation index averaging above about 35.37 on the wire side of the web when the web has a bulk of about 0.1 inches in the Z axis, or wherein

iv) the web has a formation index averaging above about 38.98 on the wire side of the web when the web has a bulk of about 0.08 inches in the Z axis, or wherein

v) the web has a formation index averaging above about 43.76 on the wire side of the web when the web has a bulk of about 0.07 inches in the Z axis.

41. The nonwoven web according to Claim 35 wherein:

i) the web has a formation index averaging above about 19.07 on the top side of the web when the web has a basis weight of about 6.0 osy, or wherein

ii) the web has a formation index averaging above about 32.03 on the top side of the web when the web has a basis weight of about 2.5 osy, or wherein

iii) the web has a formation index averaging above about 30.27 on the top side of the web when the web has a basis weight of about 2.25 osy, or wherein

iv) the web has a formation index averaging above about 28.73 on the top side of the web when the web has a basis weight of about 1.5 osy, or wherein

v) the web has a formation index averaging above about 31.07 on the top side of the web when the web has a basis weight of about 1.2 osy, or wherein

vi) the web has a formation index averaging above about 34.63 on the top side of the web when the web has a basis weight of about 1.0 osy, or wherein

vii) the web has a formation index averaging above about 37.6 on the top side of the web when the web has a basis weight of about 0.75 osy.

42. The nonwoven web according to Claim 35 wherein:

i) the web has a formation index averaging above about 31.6 on the wire side of the web when the web has a basis weight of about 6.0 osy, or wherein

ii) the web has a formation index averaging above about 35.03 on the wire side of the web when the web has a basis weight of about 2.25 osy, or wherein

iii) the web has a formation index averaging above about 37.09 on the wire side of the web when the web has a basis weight of about 2.5 osy, or wherein

iv) the web has a formation index averaging above about 35.37 on the wire side of the web when the web has a basis weight of about 1.5 osy, or wherein

v) the web has a formation index averaging above about 37.15 on the wire side of the web when the web has a basis weight of about 1.2 osy, or wherein

vi) the web has a formation index averaging above about 38.98 on the wire side of the web when the web has a basis weight of about 1.0 osy, or wherein

vii) the web has a formation index averaging above about 43.76 on the wire side of the web when the web has a basis weight of about 0.75 osy.

43. A nonwoven web comprising:

a) substantially continuous A/B bicomponent crimped fibers;

b) the web having a formation index averaging above about 43.76 on the wire side of the web when the web has a bulk to about 0.1 inches in the Z axis, or

c) the web having a formation index averaging above about 37.09 on the wire side of the web when the web has a bulk of over about 0.1 inches in the Z axis.

44. The nonwoven web according to Claim 43 wherein:

a) the web has a formation index averaging above about 37.6 on the top side of the web when the web has a basis weight of up to 1.5 osy, or wherein

b) the web has a formation index averaging above about 32.03 on the top side of the web when the web has a basis weight of over about 1.5 osy.

45. The nonwoven web according to Claim 43 wherein:

- a) the web has a formation index averaging above about 43.76 on the wire side of the web when the web has a basis weight of up to 1.5 osy, or wherein
- b) the web has a formation index averaging above about 37.09 on the wire side of the web when the web has a basis weight of over about 1.5 osy.

46. The nonwoven web according to Claim 43 wherein:

- i) the web has a formation index averaging above about 19.07 on the top side of the web when the web has a bulk of about 0.35 inches in the Z axis, or wherein
- ii) the web has a formation index averaging above about 32.03 on the top side of the web when the web has a bulk of about 0.12 inches in the Z axis, or wherein
- iii) the web has a formation index averaging above about 28.73 on the top side of the web when the web has a bulk of about 0.1 inches in the Z axis, or wherein
- iv) the web has a formation index averaging above about 34.63 on the top side of the web when the web has a bulk of about 0.08 inches in the Z axis, or wherein
- v) the web has a formation index averaging above about 37.6 on the top side of the web when the web has a bulk of about 0.07 inches in the Z axis.

47. The nonwoven web according to Claim 43 wherein:

- i) the web has a formation index averaging above about 31.6 on the wire side of the web when the web has a bulk of about 0.35 inches in the Z axis, or wherein
- ii) the web has a formation index averaging above about 37.09 on the wire side of the web when the web has a bulk of about 0.12 inches in the Z axis, or wherein
- iii) the web has a formation index averaging above about 35.37 on the wire side of the web when the web has a bulk of about 0.1 inches in the Z axis, or wherein
- iv) the web has a formation index averaging above about 38.98 on the wire side of the web when the web has a bulk of about 0.08 inches in the Z axis, or wherein
- v) the web has a formation index averaging above about 43.76 on the wire side of the web when the web has a bulk of about 0.07 inches in the Z axis.

48. The nonwoven web according to Claim 43 wherein:

i) the web has a formation index averaging above about 19.07 on the top side of the web having a basis weight of about 6.0 osy, or wherein

ii) the web has a formation index averaging above about 32.03 on the top side of the web having a basis weight of about 2.5 osy, or wherein

iii) the web has a formation index averaging above about 30.27 on the top side of the web having a basis weight of about 2.25 osy, or wherein

iv) the web has a formation index averaging above about 28.73 on the top side of the web having a basis weight of about 1.5 osy, or wherein

v) the web has a formation index averaging above about 31.07 on the top side of the web having a basis weight of about 1.2 osy, or wherein

vi) the web has a formation index averaging above about 34.63 on the top side of the web having a basis weight of about 1.0 osy, or wherein

vii) the web has a formation index averaging above about 37.6 on the top side of the web having a basis weight of about 0.75 osy.

49. The nonwoven web according to Claim 43 wherein:

i) the web has a formation index averaging above about 31.6 on the wire side of the web when the web a basis weight of about 6.0 osy, or wherein

ii) the web has a formation index averaging above about 35.03 on the wire side of the web when the web a basis weight of about 2.25 osy, or wherein

iii) the web has a formation index averaging above about 37.09 on the wire side of the web when the web a basis weight of about 2.5 osy, or wherein

iv) the web has a formation index averaging above about 35.37 on the wire side of the web when the web a basis weight of about 1.5 osy, or wherein

v) the web has a formation index averaging above about 37.15 on the wire side of the web when the web a basis weight of about 1.2 osy, or wherein

vi) the web has a formation index averaging above about 38.98 on the wire side of the web when the web a basis weight of about 1.0 osy, or wherein

vii) the web has a formation index averaging above about 43.76 on the wire side of the web when the web has a basis weight of about 0.75 osy.